The Veterinary Record

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 2. JANUARY 9, 1937. VOL. 49.

The Use of a New, Short-Acting Barbiturate—Pentothal Sodium—as a General Anæsthetic in Canine Surgery

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During recent years the use of the barbituric acid derivatives as general anaesthetics in small-animal surgery has attained great prominence, and it can with truth be said that they have almost entirely replaced the older methods of inhalation anaesthesia. Nembutal (Abbott), sodium ethyl (1-methyl butyl) barbiturate has been found to be the most useful, and whilst the administration of computed doses by the mouth and by intraperitoneal injection has been employed, the method of slow intravenous injection, assessing the regree of narcosis present as injection proceeds, is greatly superior to all others. In this country Wright and Oyler have shown that with experience this method is almost fool-proof and that safe and satisfactory anaesthesia can be induced in practically 100 per cent. of cases. Nembutal anaesthesia is maintained at its original depth for a period of about one hour, followed by a slowly lightening narcosis for a period of three to six hours. This is most valuable for the performance of somewhat lengthy surgical interferences such as abdominal operations—gastrotomy, enterotomy, metrectomy, cystotomy, etc.; it is, however, too long for the more simple and rapidly performed interferences, such as examinations under anaesthesia, radiography and fluoroscopy, simple operations such as tooth extraction, incision of abscesses, amputations of digits, etc. In these, full anaesthesia for 10 to 15 minutes is quite adequate, and it is desirable that the animal shall have completely recovered in a matter of an hour or so, so that it may be returned to its owner, otherwise the hospital tends to become over-burdened with animals recovering from the effects of anaesthesia.

The introduction of the very short-acting barbiturate sodium evipan into human dental surgery was quickly followed by its application in canine surgery. The writer's experience of this agent was that the period of recovery was associated with great narcotic excitement and for this reason it was discarded.

There has recently been introduced another very short-acting barbiturate—pentothal sodium (Abbott). It has been fairly extensively employed in human surgery in America, and Sweebe, E. E. (1936, *Veterinary Medicine*, Vol. xxxi, No. 4) has recorded its use in animals. Pentothal closely resembles nembutal chemically, in that its structure is ethyl (1-methyl butyl) thio-barbituric acid, one atom of oxygen having been replaced by sulphur.

In the dog, pentothal anaesthesia is maintained at its original depth for from 5 to 20 minutes, after which recovery is rapid, the animal being fully conscious again in from 30 to 40 minutes. The agent is dissolved in sterile water in a strength of 1 grain to 1 c.c., and administration is carried out by slow intravenous injection. As is the practice with nembutal, the first half of the dose is injected in from 30 to 40 seconds, after which it is continued slowly (assessing the degree of narcosis present as one proceeds), complete anaesthetisation occupying a period of two to three minutes. As will be seen from the protocols appended, the dose necessary to give ten minutes' full anaesthesia has varied from one-seventh to a quarter of a grain per lb. body weight. Smaller doses tend to induce very transient anaesthesia only. Young puppies would appear to be less susceptible than adults. Our practice is to assess the approximate dose to ensure that one has sufficient in the syringe, at a quarter of a grain per lb. for animals under 20 lb., and one-fifth of a grain for those over this weight, and dissolve it in the appropriate quantity of water. The method of assessing the degree of anaesthesia present is similar to that described for nembutal, *viz.*: (*a*) inability to raise the head, (*b*) complete relaxation of the lower jaw and tongue, and (*c*) depression of the pedal reflex. From the point at which the animal ceases to curl the tongue when the jaws are opened, injection is continued slowly and carefully. When the jaws are completely relaxed and the tongue hangs, limply, out of the mouth, the satisfactory depth of anaesthesia has been attained. It cannot be too strongly emphasised that two to three minutes must elapse during injection. If this practice is employed our experience is that full anaesthesia will be present for 10 to 20 minutes.

Respirations become slow and shallow, but in none of our cases has there been cause for alarm. In this connection it should be men-

tioned that CO_2 for administration by inhalation is always to hand in case of threatened respiratory failure. The pulse accelerates, 160 to 200 beats per minute, and remains strong. The pupils constrict. The induction of anaesthesia is unassociated with a period of narcotic excitement, as also has been the period of recovery. (It must be mentioned that in one case the noisy slamming of a door provoked a transient phase of excitement in a dog recovering from pentothal anaesthesia. It is important that perfect quiet shall be maintained when an animal is recovering from the effects of any non-volatile narcotic.)

The first indication that narcosis is lightening is that stiffening of the jaws and curling of the tongue occur when the mouth is interfered with. There may be licking of the nose. From this point recovery is rapid. In five minutes or so the animal will be attempting to raise the head, whilst in a further ten minutes it will be able to raise itself on to its breast. As a rule the dog is obviously quite conscious about 30 minutes after induction of anaesthesia. Limb co-ordination, especially of the hind limbs, is delayed, and the animal will stagger in a drunken fashion for an hour or so. Recovery is generally complete at two hours. There is no post-anaesthetic malaise or vomiting, nor has there been any clinical indication of damage to the liver or kidneys.

In America morphine has been combined with pentothal (the former being given by subcutaneous injection, half-an-hour before the intravenous injection of the latter), to increase the period of anaesthesia for three-quarters to one hour. We do not favour this combination. The action of morphine is so variable in the dog that accidents are liable to occur; again, the salivation, vomition and defaecation which occur with morphine are considered most undesirable. It is appreciated that subjects will be encountered in which it becomes impossible to make the intravenous injection without previous narcotisation with morphine—this has been referred to in a previous communication on nembutal. In these cases the dose of morphine should be kept low, from one-thirtieth to one-fortieth-of-a-grain per lb.

In my view, pentothal has a very definite place in canine surgery as a short-acting general anaesthetic for rapidly performed operations.

I wish to express my indebtedness to my colleagues, Mr. P. M. Sutton and Mr. J. D. Blaxland, who have worked with me in the Beaumont Animals' Hospital of the Royal Veterinary College, and to Messrs. The Abbott Laboratories for a supply of the drug. To the latter I would suggest that veterinarians would prefer the drug to be marketed either as a sterile solution or in small capsules, as is the case with nembutal, rather than in ampoules of 1 gramme. This latter method entails considerable waste.

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Pentothal Anaesthesia

(1) Five-year-old Kerry blue. M. 32 pounds. Healthy. Interdigital sepsis.

Injection three-and-a-half minutes—dose given six grains (gr. one-fifth per pound). Good light anaesthesia. Pedal and corneal reflexes just present. Respirations good, pulse 128.

No change for 19 minutes. Nineteen minutes—jaw stiffening; 27 minutes—licking nose; 35 minutes—taking notice; 42 minutes—lying on breast, quite conscious but unable to stand; 90 minutes—able to walk in drunken fashion; two hours—normal.

(2) Nine-year-old Cocker spaniel. F. Thirty pounds. Healthy. Examination abdominal cavity under anaesthesia.

Injection at usual speed. Dose given—3·75 grains (gr. one-eighth per pound). Deep narcosis only—able to curl tongue, but complete abdominal relaxation. Four minutes—narcosis lightening; seven minutes—licking nose; eight minutes—a little paddling of limbs; eleven minutes—attempting to rise; 17 minutes—on breast, conscious, but unable to walk; 30 minutes—walks with a stagger.

(3) Ten-year-old Airedale. M. Very fat. Fifty-seven pounds. Vomiting. Examination abdominal cavity under anaesthesia.

Injection at usual speed. Induction perfectly quiet. Dose given—eight grains (gr. one-seventh per pound). Good light anaesthesia. Maintained at original depth for eight minutes, when lower jaw commenced to stiffen. Fifteen minutes—rapidly recovering; 18 minutes—licking nose and attempting to raise head; 25 minutes—on breast and taking notice; two hours—able to walk but some staggering.

(4) Five-year-old Peke. M. Nineteen pounds. Condition good. Dental disease.

Injection at usual speed. Dose given—2·6 grains (gr. one-seventh per pound). Deep anaesthesia—reflexes lost. Original depth maintained ten minutes. Twelve minutes—licking nose; 20 minutes—on breast, conscious (recognised owner) but unable to stand; 40 minutes—walking with stagger.

(5) Ten-and-a-half-year-old Irish terrier. F. Twenty-four pounds. Condition fair. Gross dental disease. Injection at usual speed. Dose given four grains—deep narcosis only and a further two grains given. Total dose—six grains (gr. one-quarter per pound). Perfect anaesthesia maintained for 18 minutes, when it commenced to lighten. Thirty-five minutes—raising head; one hour—fully conscious and able to walk, but staggering.

(6) Four-year-old Aberdeen. M. Twenty-six pounds. Gross sepsis about head and face (dog bites). Temperature 104° F.

Injection at usual speed. Dose given—five grains (gr. one-fifth (minus) per pound). Perfect anaesthesia, maintained at original depth for 15 minutes. Sixteen minutes—curling tongue; 30 minutes—able to raise head; 45 minutes—on breast, fully conscious, not yet able to walk.

(7) Eleven-months-old Aberdeen. M. Twenty-three pounds. Condition good. Examine oesophagus—(oesophagoscope).

Injection—three grains in one-and-a-half minutes (gr. one-seventh (minus) per pound). Anaesthesia, complete relaxation. Seven minutes

—first change, licked nose, jaw stiffening; ten minutes—attempted to raise head; 16 minutes—definitely conscious; 25 minutes—attempted to rise but fell and rotated; 38 minutes—able to walk, some inco-ordination.

(8) Three-year-old Wire terrier. F. Twenty-six pounds. Condition good, vomiting. Examine abdomen (relaxed).

Injection—3·6 grains in two minutes (gr. one-seventh (plus) per pound). Anaesthesia, complete relaxation. Eight minutes—curling tongue, jaws stiffening; 15 minutes—raising head, a little whimpering; 24 minutes—conscious, able to stagger about.

(9) Thirteen-year-old cross-Pomeranian. M. Twenty-four-and-a-half pounds. Fat. Dental disease. Injection—three grains in two minutes (gr. one-eighth per pound). Anaesthesia complete, maintained ten minutes. Fifteen minutes—rapidly lightening; 20 minutes—raises head.

(10) Ten-week-old mongrel. M. Ten-and-a-half pounds. Acute post-pharyngeal abscess. Temperature 104° F.

Progressive injection to full anaesthesia (interference with jaw an accurate indication as lesion most painful). Three grains in two minutes (dose midway between gr. one-third and gr. one-quarter per pound). Deep anaesthesia. Six minutes, lighter: jaw—a little response; eight minutes—rapidly lightening; 13 minutes—stretching and attempting to raise head; 14½ minutes—on breast, conscious; 20 minutes—able to walk but staggering.

(11) Three-year-old smooth terrier. F. Twenty-one pounds. Condition good. Dental caries, fifth and sixth upper molars on both sides.

Injection at usual speed. Dose—four grains (gr. one-fifth (minus) per pound). Full anaesthesia for ten minutes. At 16 minutes inadvertent slamming of the door provoked marked motor excitement which persisted for two minutes and then the animal again relapsed into deep narcosis. Twenty minutes—licking nose and swallowing; 26 minutes—on breast, attempting to sit up.

(12) Five-year-old Airedale. M. Fifty-four pounds. Chronic post-pharyngeal sinus.

Injection made slowly to complete jaw relaxation, nine grains in three minutes (gr. one-sixth per pound). Full anaesthesia maintained eleven minutes. Respirations good, pulse 180.

Twelve minutes—curling tongue, some stiffening jaws; 20 minutes—voluntary movement of jaws; 21 minutes—licking nose, shivering; 25 minutes—raising head; 37 minutes—fully conscious—able to rise, but staggers and falls; two-and-a-half hours—normal.

(13) Ten-year-old black mongrel. M. Forty-one pounds. Condition good. Melanotic neoplasm right front paw. Amputation digit.

Injection made slowly to loss of pedal reflex. 6·5 grains in two minutes forty seconds (gr. one-seventh (plus) per pound). Deep anaesthesia persisted 14 minutes, respirations slow and shallow. Pulse 192. At 15 minutes pedal and corneal reflexes brisk but still anaesthetised; 25 minutes—lightening, tongue drawn into mouth; 30 minutes—raised head; 40 minutes—attempts to rise, staggers and falls; one hour—sitting up, unsteady on hind limbs; two-and-a-half hours—normal.

The campaign against the warble fly pest in cattle is to be intensified this year. The Ministry of Agriculture will ask all local authorities to promote publicity for the Warble Fly Order, which was introduced in 1936 to make the treatment of infested cattle compulsory. It has been suggested that the Order might be more strictly enforced, but the Ministry have decided that no changes should be made for next season.

Intradermal Avian Tuberculin Test in Ducks

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The intradermal avian tuberculin test as applied to the wattle has proved of considerable value in the detection of tuberculosis in fowls.

In ducks there is little reference to its use or value. In them, of course, the only convenient area for injection appears to be the web of the foot.

An opportunity has recently been afforded to us to test this method of detection of tuberculosis in ducks and the results are given below.

The avian tuberculin used had been obtained from growths of the organism on a synthetic medium.

For injection a 1 c.c. Record syringe fitted with a very fine needle half-an-inch in length was employed. The syringe and needle were boiled before use and 0·1 c.c. of the tuberculin was injected into the web between two digits. The needle had to be very obliquely directed between the two layers of the web and great care taken not to penetrate the thin membrane. The skin of the web was cleansed with methylated spirit and dried before injection.

The results were noted in 48 hours and any thickening taken as indicative of a reaction.

The observations were made in a flock of 15 ducks. In this flock there had been a number of losses from tuberculosis and the lesions found in the dead birds consisted of an accumulation of yellow floccular fluid in the peritoneum, small nodules on and thickening of this membrane and tubercles in the liver and sometimes the spleen. The peritoneal fluid was very rich in tubercle bacilli.

The 15 ducks were tested as indicated on June 18th, 1936, and examined on the 20th. Of these 15 birds, four presented a very slight, diffuse, painless swelling of the web. The thickness was compared between finger and thumb with the neighbouring portion of the web, and the increase was difficult to appreciate. The birds were not lame.

These four ducks, together with a lame duck which gave no reaction, were destroyed and examined *post-mortem*.

There was no evidence of tuberculosis in the lame duck or in one of the reactors.

The other three ducks presented the lesions of tuberculosis to a varying extent and tubercle bacilli were readily identified in films from the caseous centres of the tubercles.

The distribution of the lesions in these reactors was as follows:—

3. A number of small caseous tubercles up to size of barley grains in lungs and minute tubercles on surface of peritoneum.
4. A few small tubercles in lungs and liver and pinhead tubercles on peritoneum with some yellow serous fluid in the peritoneal sac.
5. A few small tubercles in lungs and liver and a few yellow nodules on surface of peritoneum.

The remaining ten ducks were tested again on July 8th, and of these only one presented a small bleb-like swelling around the site of injection. All these birds were then destroyed and examined, and on examination they were all found to be more or less affected with tuberculosis.

The following are the details of the tuberculosis lesions found:—

6. This duck presented a local swelling at the site of injection. A few small tubercles in liver and spleen; peritoneum dotted with pinhead-sized grey tubercles; an occasional caseous tubercle in bowel wall, and a few tubercles on pericardium.
7. A few small tubercles in liver and a fibrous attachment of pericardium to heart wall.
8. Numerous tubercles in liver, numerous pinhead-sized tubercles on peritoneum and pericardium.
9. Liver studded with large tubercles up to size of barley grains and with numerous miliary tubercles; peritoneum covered with patches of minute tubercles and two tubercles in one lung.
10. A few small tubercles in liver and on peritoneum.
11. A few small tubercles in liver, on peritoneum and in lungs.
12. Some miliary tubercles in liver and on peritoneum.
13. A few miliary tubercles in lungs and an occasional tubercle on peritoneum over pancreas.
14. Some miliary tubercles in liver and on peritoneum.
15. Some miliary tubercles in lungs; peritoneum extensively studded with small tubercles, a small tubercle in each lung and pericardium slightly thickened.

Résumé

(1) Fifteen ducks were tested with avian tuberculin, and of these ten were tested on a second occasion after an interval of three weeks.

(2) The injection was made into the web of the foot.

(3) Five ducks only gave some swelling around the point of injection.

(4) Of these five ducks, four were found to be affected with tuberculosis.

(5) Of the remaining ten ducks, nine presented to a varying extent the lesions of tuberculosis *post-mortem*.

(6) It must therefore be concluded that the tuberculin test as applied intradermically to the web of the duck's foot is of no practical value in the diagnosis of tuberculosis.

The Supervision of the Nation's Food Supply*

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Nine years ago, when I had the honour of delivering the lecture in this series, I made the remark that the task must be one of increasing difficulty as the years went on; because the lecture must deal with certain of the same topics every year, which makes it increasingly hard to say anything which has not been said before, and possibly much better. Moreover, one has a suspicion that a certain proportion of the audience may be the same, in which case the topics dealt with will be very familiar to them. Worst of all, the list of distinguished men who have given lectures in this series makes the task still more difficult, especially when one remembers that the first of these lectures was given by our present chairman.†

Up to quite recently the administration of this lectureship was in the hands of the Model Abattoir Society, which was founded by the late Sir Benjamin Ward Richardson for the furtherance of very definite objects in connection with the supervision of the nation's food. Quite recently, however, the lectureship has come under the all-covering wings of the Royal Sanitary Institute, and for that reason it is permissible, I hope, to take a somewhat wider view of the questions concerned, while at the same time not losing sight of the special points which it was originally intended to advocate.

The problem of supervising the food supply of the nation has at least the merit of antiquity, for we find that all nations of whom we have record had to face it, and made laws and regulations to deal with it. Thus the old Mosaic law defined foods as "clean" and "unclean." It prohibited the use of fat, blood, and the meats of hogs; while wasting diseases were noted for producing carcases which were unfit for human food. Immature carcases of lambs, calves and goats were forbidden, and the period of age of seven days was fixed before these carcases were considered fit for food. That very regulation is in force in some countries to-day.

The ancient Phoenicians prohibited the use

*Fifteenth Benjamin Ward Richardson Lecture, delivered by Lieut.-Colonel Leighton under the auspices of the Royal Sanitary Institute, November 10th, 1936.

†Sir William J. Collins.

of cows and hogs, but, curiously enough, esteemed the flesh of dogs. The early Athenians, as well as the ancient Romans, appointed officials to control the meat trade—meat inspectors, in fact. At one time butchers in Rome were liable to be fined if they sold uninspected meat. The Romans established elaborate abattoirs to render this work possible, which fell into disuse with the decay of the Roman Empire, only to be re-established many centuries afterwards. Then, of course, both Jews and Mohammedans prescribed methods for the slaughter of food animals, which persist to the present day, and are even provided for in the most modern legislation on the subject. One need only add that in these ancient times this food supervision was laid down partly from a ceremonial and religious point of view, and partly from a sanitary standpoint. It is interesting to note, however, that most of the regulations on examination will be found to have sound pathological basis for the countries and climatic conditions in which they operated.

This problem of food supervision, then, is a universal one, and all nations have found the solution on very much the same lines. In modern civilised nations to-day the fundamental principles on which food supervision is founded are practically the same everywhere, differing in details and in advancement, but not in principles.

What, then, are these principles which every nation finds it necessary to act upon in order to ensure that the food of the people is produced, handled, and distributed with the least risk to the health of the nation? Let us take one large staple food supply as an example. I mean the meat trade. In order to deal with this satisfactorily from the public health point of view, every modern community is finding it necessary to take the same steps, which may be summed up in the following three conditions.

First of all, there must be concentration and collection at certain centres of large quantities of the food material in question (in this case, meat) in order that the supervision, *i.e.*, inspection, may be adequate. It is 40 years now since the United States Department of Agriculture laid it down that a well regulated system of slaughterhouses is as necessary to public health as is a well regulated system of schools to public education. The analogy is very apt. It is just as impossible to educate all children in private houses as it is to inspect all meat in private slaughterhouses. Apart from any other consideration, the expense would be prohibitive.

Now although this seems so obvious, and has been recognised in modern times by every country, it has been very slowly recognised in this country, and hence the founder of this lectureship made it the first point that he wished to be stressed. He wanted the public to insist upon the erection of public abattoirs in order that a proper supervision of the meat supply could be accomplished. I do not think that anyone who has anything to do with public health administration would challenge the soundness of this principle, but the existence of thousands of private slaughterhouses with the vested interests involved has made our progress in this matter lamentably slow, and far behind most of our national neighbours. It is surely, however, only a matter of time before the difficulties which at present stand in our way may be removed. Scotland was more fortunate, owing to her laws, which closed private slaughterhouses where abattoirs were built.

The second necessity for effective supervision is the provision of a sufficient number of highly trained technical inspectors, in this case, meat inspectors. In this matter, too, our own country lagged behind for a long time, but great progress in this direction has been made during the past 20 years. It is not so very long ago when anyone could be—and was—appointed a meat inspector, despite the fact that it is a very technical occupation and one which demands skilled teaching and prolonged study. To-day local authorities insist that anyone desiring to be appointed a meat inspector must produce evidence that he is fully qualified for this duty. Various educational bodies in the country train students and hold examinations which give assurance that the candidate, having successfully passed, is a fully trained man. In this connection the Royal Sanitary Institute has done, and is doing, splendid work; while our veterinary colleges, some universities, and other educational bodies, also provide training for students as meat inspectors. That is an immense step forward from the condition of things which many of us in this room can remember.

But there is a third condition which is also necessary for the attainment of the object in view. It is not only necessary to concentrate material to be examined in large quantities at certain centres, and it is not only necessary to have an adequate staff of competent inspectors to deal with this material, but it is also necessary that these inspectors be trained to work on a uniform system, and to a uniform standard which shall be the same everywhere. Many of you will remember that in the old days when every so-called meat inspector was a law unto himself, this absence of any uniform system and standard led to most undesirable results; results which were unfair to the trade itself, and most undesirable from the point of view of the consumer. The most progressive public health authorities required a much higher standard of inspection than the least progressive. Some inspectors were known to be much more strict in their judgments, and more severe in their condemnations, than others. The result was that

traders knew where inspection was good and where it was bad or indifferent, and from that it followed that doubtful animals and carcases found their way to those places where, from their reputation, dealers hoped they could get them passed. It has taken a long time and a lot of work to get rid of that state of affairs, but here again great steps have been taken in the last 20 years which are rapidly producing a uniformity of standard.

To begin with, the inspectors themselves are receiving far better training than they did before, and, having to pass examinations of a definite standard, they are equipped with a knowledge which enables them to work in a definite way. Further than that, central public health departments both in England and Scotland have laid down definite standards of judgment for inspectors to follow. In Scotland this has been made law, and in England it has been laid down by the Ministry of Health as a standard which all inspectors are expected to follow. The standards are almost identical in both countries.

What I have been saying, of course, refers to home-killed meat, but there is just the same principle of inspection carried out in connection with the great amount of imported meat which comes into this country. We cannot, of course, dictate to foreign countries, or to other members of the Empire, exactly how they shall deal with the meat industry in their own land, but we can, and do, lay down regulations for the admission of meat from overseas, failing compliance with which it cannot be admitted. This has not been such a difficult matter as might be expected, for the simple reason that those countries that desire to send to us their bacon, or mutton, or beef, as the case may be, wish to meet the conditions laid down by the Ministry of Health because we are their best customers. The result is that the standard and quality of the meat which comes into this country is extraordinarily high. It is first of all inspected in the country of origin, it carries with it a guarantee that this has been done, and in addition it is re-inspected by our port food inspectors on arrival in this country. This same system of port food inspection is carried out in connection with the great variety of foodstuffs which we get from abroad.

I want to refer next, before we leave the meat industry, to another question which is bound up with the objects which the founder of this lectureship had in view. I mean securing and adopting the most rapid, skilled and humane methods of slaughtering all kinds of animals for human food. Here again progress in our own country during the past ten or fifteen years has been very rapid indeed. The time has long gone by when public opinion would tolerate anything approaching cruelty in the slaughter of food animals. There were times when this matter, and others like it, were regarded with amazing callousness, but that time has long departed. No one now will disagree with the view that the slaughter of food animals should be carried out as humanely as possible and with the least possible suffering. The only difference of opinion is as to the various methods by which the object in view may be attained. That is a question for experts, but the victory for humane slaughter is thoroughly established. During the past few years Parliament has passed the Slaughter of Animals Acts for both England and Scotland, thus setting the seal upon the agitation which had been going on for a long time. This is not the place nor the time to argue in favour of this or that particular form of humane slaughter, but one may perhaps be permitted to express the hope that before very long electrical methods will be so perfected for all domestic animals that there will no longer be any question as to the humane methods employed.

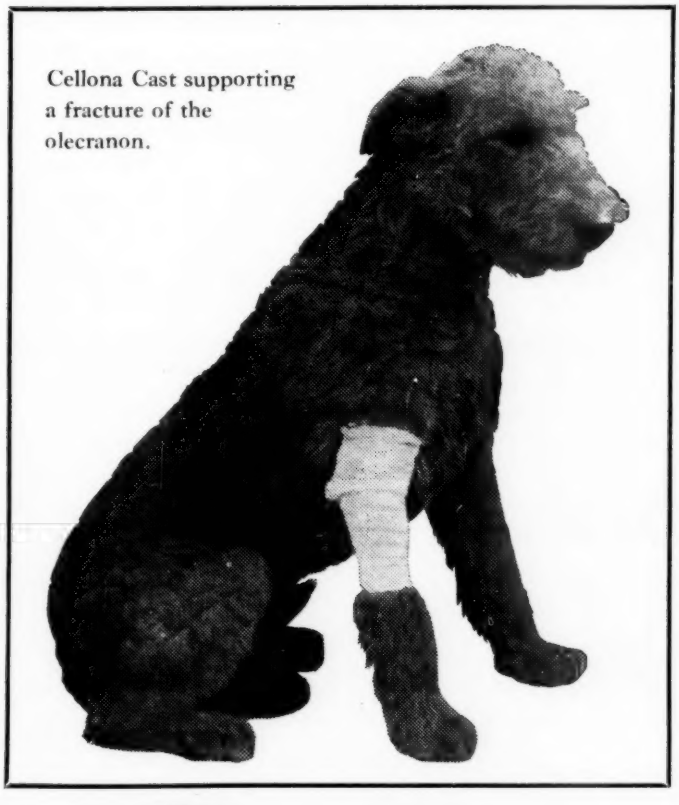
I have dealt more fully with the meat industry because it exemplifies so well the general principles of food supervision, but I should like to point out that these general principles are applicable and are applied to the supervision of many other kinds of food. Parliament has provided various acts for the protection of the food consumer, one of the most important of which is the Sale of Food and Drugs Act. This law lays it down that the purchaser of a food shall receive the article of the nature, substance and quality demanded. It is not my point here to contend that the working of this Act is always quite satisfactory. My present point is that under it an enormous amount of food is examined with great care every year by Government laboratories and by public analysts employed by local authorities. The report of the Government chemists for the year ended March 31st, 1936, shows that the number of samples examined in the course of the year was 546,279, an increase of more than 23,000 on the previous year. When to this is added all the samples analysed by public authorities, it can surely be claimed that a vast amount of care is taken to secure purity of material and protection to the consumer.

Then steps have been taken in recent years by the Government to meet special circumstances which have developed. During the earlier years of the present century a large number of food manufacturers began to use increasing amounts of chemical antiseptics in their processes of food manufacture in order to prevent the decay of the product. Had this been done with extreme moderation, it is probable that it might have gone on for a long time, but instead of that it became so notorious that very large amounts of drugs were being used in this connection that Parliament had to step in. A departmental committee was set up to inquire into the matter and report. As a result of their long and very

Extracts from
The Presidential Address to the Central Veterinary Society, December 3rd, 1936, on Bone Fracture in the Dog.

Treatment of Fractures in the Dog by the use of the Unpadded Plaster Cast

This method of treating fractures in man was developed by Dr. Lorenz Bohler, of Vienna, and since its introduction has attained great prominence in human surgery. A report has recently been published of its application in the dog. The main principles of the method are that, having replaced the displaced segments, immobilisation is effected, with the joints in a position midway between flexion and extension to overcome tension, by the application of an unpadded plaster of Paris cast. By this means the pressure is disposed evenly over the whole of the enclosed surface and an effective ecto-skeleton is formed to replace the broken endo-skeleton. Whilst the necessary fixation of the fragments is maintained, many or all of the joints of the limb are given as full a range of movement as is possible, and active movement, even the taking of weight by the limb, is encouraged almost immediately, and thus by overcoming atrophy of bones and muscles, and stiffness of joints, functional restoration is much more rapid.



Cellona Cast supporting a fracture of the olecranon.

The plaster is applied in slabs, and not as an encircling bandage. (The use of encircling (roller) plaster bandages without padding is strictly forbidden, because of the danger of causing pressure sores and severe circulatory disturbances.) It is applied lightly and carefully moulded to the skin, taking care to avoid creases. By attaching itself to the hairs it holds more firmly.

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careful inquiries, they made recommendations for the abolition of all so-called preservatives in food, except two, and these to be limited in amount. These recommendations were issued as regulations within almost record short time of their having been made. To-day there are no preservatives allowed in British foodstuffs except small quantities of sulphur dioxide and benzoic acid in certain specified instances. I venture to say that as a result of these regulations, the purity of our manufactured and preserved foodstuffs to-day is at a higher standard than it had ever been before. In doing this we have only copied the example of other nations.

Then what about the supervision of the milk supply? I do not propose to go into this matter in detail, or to discuss many of the difficulties and debatable problems connected with it. But I do want to say this, that those of us who have been engaged in public health administration most of our lives know that the condition of milk production in this country 30 years ago was such as to be difficult to describe in moderate language. Since that time we have had the Milk and Dairies Acts, the introduction of milk grading, the issuing of orders and regulations of various kinds to be carried out by local authorities, the adoption of model bye-laws for dairies by large numbers of local authorities, and an enormous amount of work done by veterinary officers and sanitary inspectors. There is no doubt, however, that there is still a good deal to be done before our milk supplies are all that we should like them to be. But I do not think there is any doubt that, from the hygienic point of view, the production of milk to-day is better than it has ever been before in this country, and on the whole, extremely good. This is an aspect of the supervision of food supply in which we are rapidly making up for lost time, and it is being done on the same general principles laid down, concentration and inspection.

One more example of how things develop. I read last week that the Bacon Development Board has laid down standards of sanitation that curers must observe as a condition of their 1937 licences. These conditions call for adequate drainage, cleanliness of premises and equipment, proper ventilation and lighting, construction and use of premises to avoid contamination of carcases, facilities for the employees to keep themselves and their equipment clean, and safeguards against the use of diseased or damaged pigs. These steps which have been taken show that those responsible fully realise that in the mild-cured bacon which is so much in demand to-day, it is essential to have an extremely high standard of cleanliness. That is a matter which demands attention in abattoirs.

What of the future? There are still certain directions in which food administration in this country lags behind that of most modern communities, especially European countries, America, and most parts of our Empire. Perhaps I may be permitted to express my own view that the matter in which we are most behind is in the lack of definite legal standards for important foodstuffs. Nearly all countries to-day have laid down by law what must be the composition of most of the foodstuffs. We have done so only in one or two cases such as butter and margarine, and for the rest we rely on sampling under the Food and Drugs Act for the detection of adulteration. To my mind it would be a very great advance if our legislators and their advisers would introduce, as soon as possible and after all consideration, definite standards, below which, or differing from which, it would be illegal to sell the foods defined. It would be easy to give numerous examples, but it is quite unnecessary. I content myself with expressing the view that in the progress of the supervision of the food of the people, the introduction of legal standards for most foods is the most important step for future development.

In what I have said I have tried to show that the objects for which this lectureship was founded must be attained by the application of certain definite principles.

Those principles are: (1) Centralisation of material; (2) provision of trained technical staff; (3) uniformity of system and practice.

(1) Theoretically the battle is won for centralisation; practically, while 16,000 private slaughterhouses remain in England, there is a long way to go.

(2) The provision of a trained body of inspectors is attained.

(3) The uniformity of system and practice is laid down.

The underlying thought I wish to leave with you is that these principles apply to the whole field of the supervision of the nation's food, and that they are the principles which it is the object of this lectureship to advocate.

We hear a good deal to-day about various methods of improving the nation's health. I should like to suggest that the most important thing of all is to secure that the people receive an ample amount of pure food. It has been shown many times that men can flourish in most undesirable conditions if only they are well fed. I do not suggest, of course, that bad environmental conditions should not be improved, but I do suggest that the first essential for national health is good food. That object can only be attained by the general application of the principles which it is the object of the Benjamin Ward Richardson Lecture to advocate.

Lambing returns indicate a large increase in New Zealand's sheep flocks. The total number of breeding ewes now exceeds 18,000,000. They produced nearly 17,000,000 lambs—a lambing average of 90 per cent.—*Reuter.*

The Veterinary Record
January 9th, 1937.

Milk and Human Nutrition

DURING recent weeks a considerable amount of correspondence has appeared in the public Press relating to the position occupied by milk in the dietary of the average rural family. Lady Denman, in a letter to the *Times*, laid emphasis upon changes in taste which are occurring amongst rural workers. Among the families investigated were very many whose *per capita* milk consumption fell far short of the one pint daily recommended by the Advisory Committee on Nutrition. Out of 24 mothers in West Kent, no less than 13 had bought no milk at all during the ante-natal period. Several households where there were children, in Somerset, could not afford to purchase milk. Numerous other instances of a reduction in, or cessation of, milk consumption are on record in rural districts. The reason underlying this appalling state of affairs is not far to seek when an example is given. To provide a pint of milk daily to each of a family of five, a sum of 8s. 9d. per week is required. When it is remembered that the general level of wages of agricultural workers is at present fixed somewhere between 30s. and 38s. (according to district) weekly, and that this amount must provide rent, clothing, and other articles of food as well as milk, it is readily appreciated that 8s. 9d. is too big a charge to be faced.

It has been stated so often that it has now become almost axiomatic, that the strength of a nation comes from its soil. There is abundant evidence that much of this strength reaches man *via* the cow's udder in the form of milk. The agricultural worker, farmer, and countryman—those nearest the soil and accordingly those drinking most milk—have in the past furnished a reservoir of healthy humanity from which the learned professions, captains of industry, defence forces, Parliament, and the arts have recruited some of their ablest sons. The crofts of Scotland at one time supplied the Scottish Universities with doctors and ministers and the London Police Force with men—men who were reared on a diet in which the excess of phosphates supplied in their porridge was counter-balanced by the extra calcium supplied in the milk. The yeoman farmers, large and small, in England and Wales have similarly contributed their quota. If we judge the present indications aright, they are that the rural taste for milk is declining. Instead of being a commonplace article of food, consumed by the countryman in pints, it is now becoming a luxurious extra added in teaspoonfuls to a mug of tea, or replaced entirely by a concoction from a tin.

Even the pregnant or nursing mother is denied by economic circumstances that amount which would make good many of the nutritional deficiencies from which she otherwise might suffer. The foundations for the mental and physical success of an individual are undoubtedly laid *in utero*, and this deprivation of milk can ultimately have only one result—the gradual deterioration of the rural man-power of the country.

The machinery for developmental control of the milk industry which has been evolved during recent years, appears to be not altogether without blame in bringing about this most anomalous state of affairs. Problems of economics are, however, controversial and unprofitable without a full knowledge of all the relevant facts. There may come a time when the Milk Marketing Board, or some other body, will have achieved a control and organisation of the national supplies of milk which will be to everyone's advantage and satisfaction, and when surpluses and deficiencies will be smoothed out to a uniform level. In the meantime, it is relevant to ask whether our profession can make even a little effort to encourage the restoration of milk to the table of the rural worker.

It is seldom possible or desirable for the veterinary practitioner or the veterinary officer to offer advice outside his legitimate province, but in these present days when the veterinary control of milk production is at least beginning to be organised upon a satisfactory basis, the milk-producer turns more and more to the veterinarian for advice on matters which may not necessarily be entirely veterinary. We feel that here and there a word of advice regarding the advisability of encouraging the farm worker to drink more milk may not be useless.

There is a very laudable system in vogue on a few farms where instead of a monetary bonus paid to the workers, a supply of milk *in lieu* is given free of charge. This might be more extensively practised. Such a "milk bonus" is only paid so long as given standards of cleanliness, efficiency and general management, are attained. When carelessness, etc., occur the men must pay for their milk. In other

districts the system of perquisites in operation has much to recommend it so long as the perquisites are sound and wholesome. An allowance of milk per week to each household is granted—either on the basis of a purely nominal charge, or on the basis of cost of production only. In some areas this is regarded as constituting part of the wages; in others it is an extra.

It seems reasonable to suggest also that an improvement in the position might result from a better utilisation of surplus summer milk and of the skim milk surplus from creameries. It seems somewhat strange that among all the advances which have taken place in cold temperature preservation of foods, no method has been evolved which will preserve liquid milk for a period longer than a few days in such a way that its full nutritive properties are conserved. Doubtless in time this particular problem may be solved. Possibly in a time of emergency and food shortage a milk reserve might be instrumental in maintaining infant life at a high level; when, for example, a considerable proportion of the milch cows in an area were killed by the use of poison gas, and milk supplies were consequently disorganised.

Skim milk itself is a valuable food whether for human or animal use. The prejudice against skim milk could be readily overcome if farm workers were made to understand clearly that essentially it differs from whole milk only in the reduction of its fat content. It forms a very valuable source of supply of milk proteins, carbohydrates and those other numerous substances which make normal milk such a valuable food.

Doubtless the real onus of stimulating or reviving a greater interest in milk as a common food and increasing its consumption among the rural population, principally rests on the members of our sister sciences—medicine and agriculture. Admittedly many schemes are beginning to be put into operation which have as their object a higher consumption of liquid milk. Many of these, perhaps especially the opening of milk bars and the Milk for School Children Scheme, are entirely laudable. The former, however, only benefits the urban dweller, while there is a good deal of evidence that the latter is not being well supported in rural areas. The farm worker is usually the last person to benefit from any organisation or welfare campaign. He and his family are more isolated and remote from educational contacts and opportunities than is the urban worker; he is by the nature of his calling usually more robustly independent and self-reliant, and it must be admitted, far more conservative. Unless some considerable effort be made—and that soon—we may witness the advent of a country population who know not milk as the most important human food for that very class which needs it most.

REPORTS

On the State of the Public Health

ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER OF THE MINISTRY OF HEALTH FOR THE YEAR 1935.

The progress made during recent times in matters of public health, which is reflected in this Report and its predecessors, may perhaps best be summarised by two significant extracts. "Since the Ministry of Health was founded great results have been achieved, and despite increasing population, increasing urbanisation, and the aftermath of the world-wide War the standard of national health has been raised to heights undreamed of when Chadwick and Simon started their beneficent work." This gives the result; an important aspect of the means by which it has been made possible is indicated in the second quotation—"The dividing line between preventive and curative medicine grows fainter and fainter and in many instances has virtually disappeared."

The Report deserves to be read in full, but the sections dealing with the following subjects are possibly of the greatest interest.

Vital Statistics.

At the time of the census in April, 1931, the population of Great Britain was 44,795,357; in 1935 the estimated mid-year population of England and Wales was 40,645,000. The number of deaths during 1935 was 477,401, the five principal certified causes of death being diseases of the heart and circulatory system, malignant disease (cancer), respiratory diseases such as bronchitis and pneumonia, diseases of the nervous system, and all form of tuberculosis. It is gratifying to note that the number of deaths of infants under one year of age—34,092—was the smallest ever recorded. This improvement has compensated for the declining birth-rate, but the compensation is unlikely to persist; the present portents indicate that by the middle of the century the population will have attained its maximum and will thereafter decline. In the meantime a change in the age distribution, already noticeable, will continue.

Experimental Epidemiology.

A summary is given of the published work of Greenwood, Topley, and their colleagues at the London School of Hygiene, derived largely from the Medical Research Council Report (Special Report Series No. 209). References are also made to the recent work on the epidemiology of streptococcal infections, and to the work of Dr. W. N. Pickles, of Aysgarth, a country medical practitioner who for years has kept careful note of every event bearing upon epidemiological happenings in Wensleydale. Under the circumstances in which he works, it has been possible to trace to its source practically every case of infectious disease, and such matters as methods of spread, incubation period, duration of infectivity and rôle of carriers, have been studied to the best advantage. Other practitioners with similar opportunities and tastes are urged to put some of their epidemiological observations on record.

General Epidemiology.

During 1935 the number of infectious diseases showed no unusual or disquieting features, and brief references are made to the incidence of, and some of the more recent work on, measles, scarlet fever, diphtheria, whooping-cough, enteric fever, malaria, pneumonia, Weil's disease, cerebro-spinal fever, poliomyelitis, psittacosis, and Pink disease, the aetiology of which is at present unknown.

Maternity and Child Welfare.

In 1935 it was reported that the tolerance of mice to the haemolytic streptococcus (human origin) was increased by doses of a chemotherapeutic agent called prontosil. Laboratory and clinical experiments have been repeated in this country, and there is a suggestion that the drug exerts a beneficial effect on patients infected with a haemolytic streptococcus.

Tuberculosis.

The number of persons in England and Wales who died from tuberculosis in 1935, was 29,201, that is 11,186 fewer than in 1925, although the population has increased in the interval. It is not easy to assess the influence of the various factors which play their part in this reduction of mortality, and at the moment it is impossible to estimate how much of the improvement is attributable to each.

Cancer.

Aetiological researches on cancer have in the main been concerned with two principal channels of investigation, which have yielded promising results, and which may be distinguished by the names carcinogenic substances and virus diseases. The former substances, namely, certain constituents of tar, have been shown to be closely similar in their chemical constitution to certain substances produced in the human body, which are themselves active cancer producers under experimental conditions. The other channel of investigation was suggested by the discovery that certain malignant tumours of fowls can be transmitted experimentally, and the differences of outlook between this theory of causation and that depending upon carcinogenic substances seem less irreconcilable when it is found that a tumour produced by a carcinogenic substance might exhibit the feature of transmissibility by cell-free extracts which is characteristic of the virus-produced tumours. Progress in diagnosis and treatment continues, and preventive measures are also considered in the Report.

Rheumatic Diseases.

Some of the research work has suggested that haemolytic streptococci may play an important part in the aetiology of acute rheumatism, but that they are much less related to the cause of rheumatoid arthritis. Special mention is made of the work of Stuart-Harris, who has shown that, whereas the blood of patients with rheumatoid arthritis is susceptible to streptococcal fibrinolysis, the blood of rheumatic fever or scarlet fever patients is resistant to fibrinolysis.

Relation of Food to Health and Disease

This is probably the most important part of the Report for veterinarians.

Milk (Special Designations) Orders, 1923 and 1934.

The number of producers' licences for certified and grade "A" (T.T.) milk in force at the end of 1935 was 814. During the year 300 new licences were issued to producers of these grades, and the net increase in licences issued by the Ministry during the year amounted to 217. Before the issue of a licence it has been necessary to insist to varying degrees on improvements both in equipment and methods of milk production, in order to ensure regular and consistent compliance with bacteriological requirements. Instances have occurred in which the structural condition of cowsheds has necessitated partial or complete demolition and rebuilding. Provided general and climatic conditions are suitable, an economical and efficient solution of such difficulties is the erection for milking purposes only of a small hygienic shed on simple lines.

Approximately 370 veterinary practitioners approved by the Ministry were employed to test licensed herds in England. Improvement in the method of applying the double intradermal tuberculin test continued, doubtless owing to the increasing use of the test, the better knowledge of its technique, and the more widespread employment of tuberculins of known high potency, such as the tuberculin prepared in synthetic media.

The presence of tubercle bacilli was reported in supplies of designated milks obtained from tuberculin tested herds in nine cases during

1935, one of these supplies being the mixed milk of seven licensed herds, comprising approximately 330 cows. The circumstances of each case were investigated by the veterinary staff of the county authority concerned.

Milk (Special Designations) Order, 1936.

This new Order supersedes the Orders of 1923 and 1934. Three grades of milk are recognised, namely (1) tuberculin tested, (2) accredited, (3) pasteurised. The first two of these grades are raw milks and correspond approximately to the former grade "A" (T.T.) and grade "A" milks respectively, although the conditions for the production of the two new grades differ from those which applied to grade "A" (T.T.) and grade "A." The conditions for the tuberculin testing of a herd producing T.T. milk have been amended so as to increase the safeguards against the introduction of tuberculosis into the herd, and the inoculation of animals in the herd with living *Brucella abortus* is prohibited. After December 31st, 1936, general bacterial counts for the first two grades of milk will be replaced by a methylene blue reduction test, and, in addition, a coliform test is prescribed.

For pasteurised milk an important new requirement is the insertion, to the satisfaction of the licensing authority, of indicating and recording thermometers in suitable places in the pasteurising plant.

Licences, granted hitherto by the Ministry of Health, will now be granted by County and County Borough Authorities.

There is evidence that milk sold as pasteurised milk is not always properly and efficiently pasteurised, and consequently there is a danger of engendering a false sense of security. A phosphatase test may now be regarded as an important means for the control of pasteurisation. A detailed description of the test is given in *The Journal of Dairy Research* (1935), 6, 191.

Milk-borne Disease.

During the year two outbreaks of scarlet fever were reported in which the infection was shown to be conveyed through milk, and in May, 1935, there was an outbreak of staphylococcal food poisoning associated with milk. The symptoms occurred a few hours after some custard with an unpleasant taste had been eaten. Haemolytic *Staphylococcus aureus* were obtained from specimens of the custard, and the milk of the herd responsible was examined. The cows appeared healthy. Specimens of their milk, however, yielded growths of *Staphylococcus albus*, *Staphylococcus aureus*, and a non-haemolytic streptococcus.

Cases of undulant fever continued to come to the notice of the Ministry of Health during 1935; the actual number was 33, but, judging from the experience of previous years, it is expected that additional cases occurring during the year will come to light later. Several of the patients were consumers of special grades of raw milk, for example, five—or possibly only four—of these patients drank certified milk, six drank grade "A" (T.T.) milk, and eight drank grade "A" milk, and it is pointed out that all these grades of milk are just as liable to contain *Brucella abortus* as ordinary raw milk. Some of the features of the disease are recorded in order to assist practitioners in recognising it.

Imported Foods.

Careful watch continues to be kept at the ports over all kinds of imported foodstuffs. At present imported fresh meat and animal fat, with certain exceptions, is required to bear an official certificate from the country of origin guaranteeing it to be derived from animals free from disease at the time of slaughter.

Meat Inspection.

Little change has been made in the methods of meat inspection in this country. It is, however, pointed out that perfect inspection and control can only be secured when animals are killed in central abattoirs and the inspector sees every animal at the time of slaughter.

Food Poisoning.

A total of 137 outbreaks of suspected food poisoning was reported in 1935. Fifty-three were due to Salmonella infection, twelve were associated with dysentery bacilli. In 21 instances staphylococci were present or were isolated from the suspected food, and in nearly all these cases the staphylococci predominated so greatly that their connection with the toxicity was rendered highly probable.

Several points of interest emerge from consideration of the Salmonella infections. Ducks' eggs were suspected in ten outbreaks, but it was not possible to trace any of the suspected ducks. Beef from the carcase of an animal which was almost certainly suffering from a Salmonella septicaemia when slaughtered was responsible for another outbreak, caused by *S. typhi-murium*. A further outbreak was ascribed to beetroot sold already cooked at market stalls, the most probable hypothesis being that a particular stallholder had been suffering from infection with *S. enteritidis* and had contaminated the cooked beetroot, since subsequent experiments showed that such beetroot can harbour living Salmonellas at its surface for at least a week.

Botulism.

Since 1922, when an outbreak of botulism occurred at Loch Maree, there had been no authenticated cases until August, 1935, when there were three deaths from botulism in the North of London. The cause of illness was the consumption of a vegetable food called nut meat brawn, contained in air-tight glass jars. Later in August another fatal case occurred in London, and from the incriminated steak pie

C. botulinum, type B, was isolated. This is the first time that this type of botulinus bacillus has been obtained in this country in connection with a human case; the previous cases had been associated with type A.

. . . . . .

It is impossible here to review adequately the thirteen Sections and eight Appendices of this Report, which contain many more facts of interest and value to the veterinary profession.

R. L.

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Livestock Improvement Scheme*

In the *Journal of the Ministry of Agriculture* for November, 1936, a review of the year's working of the above scheme is given, in which a number of important and interesting facts are recorded.

Perhaps it will be most convenient to attempt to review the report under a series of headings.

Premium Bulls.—The fixing of prices for milk and the consequent stimulus to milk production, together with the unsatisfactory profits from beef production, have resulted in a less active demand for premium bulls under the Ministry's scheme than is desirable, and also in a somewhat indiscriminate use of dairy bulls for crossing purposes on beef-type cows, which will have an adverse repercussion on quality in the course of time. The standard of store cattle has already suffered from this practice, and there is in the meantime a shortage of the best type of animals for feeding purposes.

Confusion in the minds of farmers between premium bulls and licensed bulls has resulted in an impression that improvement would rapidly result from the use of the latter type. It is pointed out that the licensed bull seldom approaches the standard required for a premium bull. The total number of premium bulls at the end of March, 1936, was 1,469—a decrease of seven from 1935. It is interesting to note from the table given that in the 22 years since the scheme started there was a fairly steady, gradual increase from 497 in the first year to 1,476 in 1929-30, since when the numbers used have remained practically constant around that figure. The number of cows served per bull was 65—the report gives 67, which is possibly a misprint—but a criticism might be that here, where an opportunity for providing some valuable physiological data is given, there is no mention made of the number of calves born and reared, nor of the average fertility of the bulls of each breed. Shorthorns continue to provide just over half the total number—750. Herefords and Devons come next with 218 and 202 respectively; there were 157 Lincoln Reds, 77 Welsh Blacks, 29 Guernseys, 14 South Devons, and less than 10 each in the case of Aberdeen-Angus, Friesians, Galloways, Red Polls, and Sussex.

Premium Boars.—The report states that there are indications of a general improvement in the quality of pigs. Encouraged mainly by the operation of the Pig Marketing Scheme, owners are now paying far more attention to the selection of breeding stock on lines which will produce the right type of stock. Many farmers are increasing the number of sows they keep and using their own boars, so that the number of premium boars instead of increasing remained at 1,029—three less than in the previous year. The average number of services is stated to be 65, the number of sows served being 63·8 per boar. As with premium bulls, no figures are available for the average degree of fertility.

The great majority of the premium boars were Large Whites (970), the only other breeds to reach double figures being Welsh, with 33, and Large White Lop-eared with 10.

Premium Rams.—Only 30 premium rams were provided, all for the Welsh Mountain breed, and all confined to Wales, under the scheme for the improvement of the Welsh Mountain breed. An average of 60 ewes per ram were served.

Heavy Horse Grants.—Heavy horse breeding societies operating under the Ministry's scheme have continued and increased their activities. There were 185 stallions under the scheme—the highest number since its initiation in 1914. The average number of mares served was 95, and there was a total of 4,918 assisted nominations to mare owners. There were 144 Shire, 22 Clydesdale and 19 Suffolk stallions in 1935, as against 132 Shires, 22 Clydesdales and 16 Suffolks in 1934.

The number of foals produced was 9,259—equal to a fertility rate of 58·5 per cent. It is interesting to note that the foaling percentages of the three breeds was 68·1 for Suffolks, 58·6 for Shires and only 52·4 for Clydesdales.

Licensing of Stallions.—To 1,945 applicants for licences under the Horse-Breeding Act, 1918, 1,893 were granted, 52—or 0·374 per cent.—were refused. Of the rejections 48 were heavy breeds and 4 were light breeds. A table is given showing the breed distribution of licensed stallions—the majority being Shires (*viz.*, 1,074).

The stallions rejected for each of the prescribed diseases were as shown in the accompanying table:—

Whistling	5
Roaring	12
Sidebone	15
Bone Spavin	4
Ringbone	5
Shivering	2

*Report for year ended March 31st, 1936.

Stringhalt	2
Cataract	6
Defective Genital Organs ...	1
Poor Conformation and Physique	2

It is interesting to note that of these 52 rejections, practically 50 per cent. (*viz.*, 24) were for osteo-arthritic affections; while if the wider classification of "rheumatic disease" is accepted, no less than 45 stallions (*viz.*, 86·5 per cent.) were refused licences on account of being affected with one or other of the conditions which can be grouped under this heading.

Importation of Canadian Cattle.—There has been a remarkable reduction in the numbers of Canadian cattle imported—only 2,304 being landed, as against 47,850 in the previous year. Of those suitable for breeding, among 616 offered only 370 were found on inspection to be satisfactory. The main reason for the reduction appears to have been the greater flow of Canadian cattle across the frontier into the U.S.A. following the much greater demand experienced from the latter country—probably dependent upon the wave of greater prosperity which has begun.

Licensing of Bulls.—The real effect of the 1931 Act is now beginning to become obvious. The number of licences issued has risen from 22,607 in the year ending in July, 1935, up to 31,969 for the year to the end of March, 1936. It is stated that some 38,426 applications were received, and that 4,690 applications were rejected. Thirty-two licences were suspended, mainly, it is stated, on account of ringworm.

The report states that as the older bulls die out the time should soon be reached when practically all bulls in the country being used for service will be licensed animals. Some carelessness has been encountered and a certain number of prosecutions for keeping unlicensed bulls have had to be instituted, but generally the response on the part of owners seems to have been satisfactory.

The Ministry officials are endeavouring to raise the standard of excellence before granting a licence, and the number of refusals has risen from 9·5 per cent. in 1935 to 12·8 per cent. in 1936. The full effects of the scheme will only become noticeable when the improvement in the quality of the general average commercial bullock, which has already begun, becomes widespread. Some variation in the standards adopted must of necessity occur during the early years of a scheme like this, depending largely upon the general quality of the stock in each area of the country.

Milk Recording.—This section includes a number of statistical tables which, unless they were to be reprinted in full, do not lend themselves to a brief summary. Certain facts are, however, of great interest as demonstrating the good effects that the Milk Recording Societies are having.

The average yield per cow (for the full-year cows) was 734 gallons—the highest yet recorded. Increased average yields were shown by 43 out of the 49 Recording Societies—the exceptions being in the north of England and Wales. The Derby and District Society had the highest average yield—839 gallons per cow. The standard yields for breeds (*viz.*, Friesians, 10,000 lb.; Ayrshires, Blue Albions, Lincoln Red Shorthorns, Red Polls and Shorthorns, 9,000 lb.; Devons, Guernseys, Jerseys, South Devons, Welsh Blacks and other breeds, 8,000 lb.) have been reached or exceeded by no less than 22,082 cows. Two Ayrshires, 68 Friesians, 2 Red Polls and 7 Shorthorns have given over 20,000 lb. The highest yield of the year for a milk-recorded cow was given by a Friesian in the Essex Society—2,925 gallons (30,220 lb.).

A record number of Certificates of Merit has been issued. It will be remembered that these certificates are only awarded to cows which for three consecutive milk recording years have given the standard yield for their breed and have been regular breeders. One particular certificate was issued for a cow which yielded no less than 71,849 lb.—the highest figure yet recorded on a Certificate of Merit.

The Calf- and Bull-Marking Scheme and the Butter-fat Testing Scheme have not perhaps made such relatively good progress, but doubtless these will be better supported as the benefits to owners become more obvious. Various other features, such as rationing, and cost of milk recording, are briefly mentioned.

W. C. M.

* * * * *

[**An Inquiry into the Drinking Habits of Children of School Age, with special reference to Milk Drinking.** Wright, N. C. (1936.) The Hannah Dairy Research Institute, Bull. No. 7.]

In the autumn of 1934 there was initiated the Milk in Schools Scheme, under which milk is supplied free or at a reduced price to children attending State-aided schools. By this means it was hoped to foster the milk-drinking habit among children. The present investigation was undertaken to ascertain the habits of the children prior to the commencement of the scheme and will therefore be supplemented by another such report in four or five years time, when the influence of the scheme may be determined.

The inquiry included nearly 14,000 school children, of whom two-thirds lived in Glasgow and one-third in rural or urban districts of Ayrshire, providing a representative sample in these areas. The method adopted consisted essentially of a questionnaire on the drinking of the previous day to be answered by each child as a memory test. It is important to note that the results obtained relate to the milk drinking habit and not the total consumption

or *per capita* consumption of milk. The most striking result was the fact that over 50 per cent. of all children did not drink milk at all, while of the remainder, two-thirds only took it once daily. In suburban schools, those children who did not take milk constituted 40 per cent., whereas in the poorer schools this proportion rose to 60 to 80 per cent. Even in rural districts only 50 per cent. of the children drank milk. Tea-drinking, on the other hand, was remarkably prevalent, only 5 per cent. of all children failing to take it once a day, while 50 per cent. took it three or more times a day. Cocoa and coffee were comparatively neglected, while porridge, an excellent vehicle for milk, was only eaten regularly by one child in three.

Although milk drinking in children has been doubled by the operation of the Milk in Schools Scheme, the author points out that this encouraging result cannot be regarded as permanent, since there has been a progressive decline since the inception of the scheme. With a view to stimulating the habit, a supply of flavoured milk was distributed in certain schools, but while the immediate effect was marked no permanent result ensued. It is of note that the decrease in demand for milk under the scheme has taken place among those children who pay for their milk, the number receiving free milk showing a progressive increase. The conclusion is drawn that to achieve the permanent result desired from the scheme free milk must be provided to all school children so that neither poverty nor indifference need hinder the fostering of a milk-drinking habit. While such a radical amendment would require special legislation, much could be done by clarifying the existing Acts under which marked anomalies of interpretation may exist in different areas. A broader universal interpretation would markedly increase the number of children receiving free milk. S. J. E.

"THE SCOTTISH FARMER" ALBUM, 1937

"*The Scottish Farmer* Album and Farming World Year Book" was first issued in 1898 and the 1937 number, much increased in size and value to its readers since the early days of this popular feature of farming literature, contains many special articles and reviews of the past year's activities of the Scottish livestock industry. As in former years, the first place among the special articles is given to a comprehensive review of the leading "Legal Decisions of the Year," while an article of much interest to cattle breeders is "Argentine Impressions and Recollections," by the well-known Aberdeen-Angus breeder, Mr. William J. Reid. The breed reviews are the work of specialists, and the publication is also notable for its picture gallery of prominent agriculturists and the season's prize winning animals. The price of "The Album" is 1s. 6d., or post free 1s. 10d., and copies can be had from any bookseller, or direct from the office of *The Scottish Farmer*, 93, Hope Street, Glasgow, C.2.

ABSTRACTS

[**Comparative Experiments with B C G.** (Trans. title.) Report of the Scientific Committee of the Institute for Anti-tuberculous Vaccination, Milan. (1936.) *Pat. Comp. Tuberc.* **1.** 1. 2. 1-14 and 65-124. (Numerous tables and figs.)]

The experiments recorded in this report are part of the work which has been undertaken to compare the value of B C G, virulent bovine tubercle bacilli killed by heat and attenuated bovine tubercle bacilli as agents for the immunisation of calves against tuberculosis.

Preliminary experiments were carried out with four calves in order to test the virulence of the particular strain of *M. tuberculosis* to be used throughout the work, to determine the resistance of newly-born calves to massive doses of killed tubercle bacilli and to obtain some information on the comparative protective value of a single subcutaneous injection of B C G and a single intravenous injection of *M. tuberculosis* killed by heat.

One calf received 50 mg. B C G subcutaneously at birth, another 500 mg. killed *M. tuberculosis* intravenously and the other two served as controls. When three months old, all the calves were injected intravenously with 3 mg. of virulent *M. tuberculosis*. The control animals died after 48 days from pulmonary tuberculosis, the calf which had received B C G showed small lesions in the pulmonary lymph gland when killed three months later, and the calf which had received killed tubercle bacilli showed evidence three months after vaccination of having contracted a natural tuberculous infection.

In a further experiment made in order to compare the protective value of B C G, B C G killed by heat and *M. tuberculosis* killed by heat, 20 calves were divided into four groups. Three groups were vaccinated at birth with one or other of the agents to be tested and the fourth group was left as a control. All the animals received an intravenous injection of 5 mg. of virulent *M. tuberculosis* when they were about three months old. Three of the four control calves died in 25 to 35 days from pulmonary tuberculosis. Three of the five calves which had been vaccinated with killed B C G and the same number which had received killed *M. tuberculosis* died at varying intervals after the injection of the test dose, whereas only one animal which had been vaccinated with B C G died. All the animals which died showed lesions of tuberculosis on *post-mortem* examination. J. A. N.

[**Transmission of Foot-and-Mouth Disease by a Bovine several months after Recovery.** (Trans. title.) Pineteau and Bourbon. (1936.) *Rec. Méd. vét.* **112.** 3. p. 159.]

A heifer, infected with foot-and-mouth disease in April, 1935, is said to have transmitted the disease to other cattle during the following August. No outbreak had occurred in the locality for several years and there appeared to be no other source of infection. The heifer remained immune.

E. C. H.

* * * * *

[**Immunisation Experiments with Swine Influenza Virus.** Shope, R. E. (1936.) *Exp. Med.* **64.** 1. pp. 47-61.]

A series of experiments was performed to determine the effect of dosage, route of administration, and source from which the virus was obtained, upon the efficacy of swine influenza virus in the immunisation of swine, ferrets and mice.

Swine could be immunised by the intramuscular or subcutaneous inoculation of swine influenza virus obtained from the lungs of infected ferrets and mice. Ferrets were found to be immune to intranasal infection with the virus after having received a subcutaneous injection of virulent ferret lung material. Mice were immunised to intranasal infection by the subcutaneous injection of virus from the lungs of infected mice, but not to the injection of virus from the lungs of ferrets and swine. Intraperitoneal inoculation of ferrets and mice immunised them to intranasal infection.

In two field experiments swine influenza followed the intramuscular inoculation of virus when this method was adopted as a means of immunisation against the disease.

E. C. H.

* * * * *

[**Research on the Chemotherapy of Brucellosis.** (Trans. title.) Mussemeier, F. (1936.) *Bull. Office Internat. des Epizooties.* **12.** 152; Ruzicka, J. (1936.) *Ibid.* **12.** 165.]

I.—Colloidal sulphur in gelatin, colloidal sulphur (Heyden), and formaldehydebisulphide of sodium (Merck and also Volkmar) have been used. Administration failed to prevent abortion and failed to cure active udder infection. Targesine (a silver preparation), methylene blue, trypaflavine, tartar emetic, Naganol, benzoptol, iodine, urotropine, amphotropine, Streptozone, Verkalbine and carbolic acid have all been shown to be valueless, and no useful therapeutic agent has been found.

II.—Carbolic acid, trypan blue, acridine derivatives and amphotropine have little or no therapeutic value. Good results are claimed in Italy for Abortosan. This preparation is given in five to seven daily doses of increasing strength administered intravenously. Abortosan should be dissolved in double glass-distilled water, and the solution should be made up by artificial light. The value of this preparation has not yet been confirmed by independent workers.

E. J. P.

* * * * *

[**The Use of Hexachlorethane in the Control of Mosquitoes.** (Trans. title.) May, R. M. (1936.) *Ann. Inst. Pasteur.* **57.** 3. 325-336.]

The writer suggests hexachlorethane for use against mosquitoes and relates some of his experimental results. Adult mosquitoes are killed in air in which hexachlorethane is sublimed, and larvae and pupae die in water in contact with the air in which the drug is sublimed in sufficient strength. Finely-powdered hexachlorethane in talc (2 parts to 1) is spread on the breeding places of mosquitoes.

Advantages claimed for this method are that it is cheap, not poisonous to man or animals, and the minute crustacea, which are the food of fish, and surface vegetation are not killed by concentrations lethal to mosquito larvae. A further advantage is that female mosquitoes are not repelled and driven to ovipositing in other, and possibly inaccessible, collections of water.

J. S. S.

CENTRALISED SLAUGHTERING

"The £150,000 factory abattoir planned by Leicester City Council may be the first to be erected under the three experimental central slaughtering schemes proposed by the Government in their Livestock Industry Bill," says *The Farmers' Weekly*, and adds: "The Leicester plan was deferred during 1936 following opposition by meat traders' and farmers' organisations. Now it is to be reconsidered by the Cattle Markets Committee in the light of the Government's proposals.

"Councillor C. J. Pearse, Chairman of the Cattle Markets Committee of the City Council, said to the *Farmers' Weekly*: 'The Bill follows the recommendations of the Government's Technical Committee on Abattoir Design. Those recommendations formed the basis of the scheme already considered by the Leicester City Council.'

"The Livestock Industry Bill proposes Exchequer assistance up to £250,000 in all for the erection of the three experimental slaughterhouses. The Leicester project, if approved for submission as one of the experimental schemes, would have to be considered by the Livestock Commission, who would consult agricultural and other interests before making any recommendations to the Government. Control over other slaughtering facilities in the area, including the closing down of the redundant slaughterhouses, would be exercised by the Commission, but it would be the duty of the Council to equip and manage the central slaughterhouse."

N.V.M.A. Congress, Bournemouth, July 26th to July 30th, 1937

PROVISIONAL PROGRAMME

The following is the Provisional Programme of the Association's Congress to be held at Bournemouth from July 26th to July 30th, 1937* :—

MONDAY, JULY 26TH.

10 a.m.—Civic Welcome by the Mayor of Bournemouth. (Grand Hall.)
10.30 a.m.—Opening of Exhibition of Surgical Instruments, Drugs, etc., by the President. (Lesser Hall.)
11 a.m.—Paper : " Diseases of Poultry." (Grand Hall.)
Evening.—Civic Reception and Dance. (The Pavilion.)

TUESDAY, JULY 27TH.

10 a.m.—Paper : " Veterinary Inspection in Bacon Factories." (Grand Hall.)
11 a.m.—Paper : " The Control of Tuberculosis by means of the Tuberculin Test. (Grand Hall.)
2.30 p.m.—Operations and Demonstrations. (Corporation Stables.)
8.30 p.m.—President's Reception. (Royal Bath Hotel.)

WEDNESDAY, JULY 28TH.

10 a.m.—Paper : " The Application of Vaccine Therapy." (Grand Hall.)
11.30 a.m.—Paper : " Stuttgart Disease and Nephritis." (Grand Hall.)
2.30 p.m.—Council Meeting. (Grand Hall.)
3.30 p.m.—Annual General Meeting. (Grand Hall.)
7 for 7.30 p.m.—Annual Banquet. (Royal Bath Hotel.)

THURSDAY, JULY 29TH.

Excursion.
Post-mortem examination in connection with proposed demonstration of the application of the tuberculin test to a number of animals by various members of the profession.

FRIDAY, JULY 30TH.

10 a.m.—Paper : " The Clinical Aspects and Treatment of ' Hoose ' (Parasitic) and Allied Conditions in Cattle." (Grand Hall.)
11.45 a.m.—Closing Meeting. (Grand Hall.)

SUBJECTS FOR PAPERS

VETERINARY MEDICINE AND SURGERY SECTION

(*President* : *J. F. D. Tutt, Esq.*, F.R.C.V.S.)
(*Vice-President* : *Major J. Stewart Wood*, M.R.C.V.S.)
(*Recording Secretary* : *G. N. Gould, Jun., Esq.*, M.R.C.V.S.)

1.—" Stuttgart Disease and Nephritis."
By Nevill S. King, Esq., M.R.C.V.S., Leatherhead.
Opener : Professor G. H. Wooldridge, F.R.C.V.S., M.R.I.A., London.

2.—" The Clinical Aspects and Treatment of ' Hoose ' (Parasitic) and Allied Conditions in Cattle."
By R. H. Smythe, Esq., M.R.C.V.S., Camborne.
Opener : Capt. O. V. Gunning, M.R.C.V.S., D.V.M., Tutbury.

EXPERIMENTAL PATHOLOGY SECTION

(*President* : *C. V. Watkins, Esq.*, M.R.C.V.S., D.V.S.M.)
(*Vice-President* : *Major A. A. Pryer*, D.S.O., M.R.C.V.S.)
(*Recording Secretary* : *N. S. Barron, Esq.*, B.SC., M.R.C.V.S.)

1.—" Diseases of Poultry."
By W. P. Blount, Esq., F.R.C.V.S., Lewes.
Opener : Major T. Dalling, M.R.C.V.S., Beckenham.

2.—" The Application of Vaccine Therapy."
By Dr. W. S. Gordon, M.R.C.V.S., Edinburgh.
Opener : Capt. S. J. Motton, F.R.C.V.S., Penzance.

PUBLIC HEALTH SECTION

(*President* : *S. B. Vine, Esq.*, M.R.C.V.S.)
(*Vice-President* : *Eoghan Clark, Esq.*, M.R.C.V.S., D.V.S.M.)
(*Recording Secretary* : *G. Warnock Begg, Esq.*, M.R.C.V.S.)

1.—" Veterinary Inspection in Bacon Factories."
By D. J. Anthony, Esq., M.R.C.V.S., D.V.S.M., (VICT.), Brierley Hill.
Opener : C. H. Ducksbury, Esq., M.R.C.V.S., D.V.S.M., Calne.

2.—" The Control of Tuberculosis by means of the Tuberculin Test."
By Major A. Douglas, M.R.C.V.S., D.V.S.M. (VICT.), Ayr.
Opener : S. V. Golledge, Esq., M.R.C.V.S., Trowbridge.

* N.B.—Additional social features will be notified later.

REVIEW

[Refrigeration for the Farm and Dairy. By C. A. Cameron Brown. Oxford University Press, 1936. Price 1s. 6d.]

This little book of 50 pages gives an excellent discussion of the principles, practice and appliances of refrigeration as it can be carried out in the service of the farmer. The descriptions are mainly non-technical but errors of simplification are avoided. The various apparatuses that can be used in the cooling and storage of milk are described in some detail and fairly appraised, the costs of running not being overlooked. The advantages and disadvantages of the use of ice or of solid carbon dioxide in portable cooling are discussed. A chapter is devoted to the gas storage of fruit whereby apples, according to the variety, are preserved at low temperature in atmospheres of different concentration of carbon dioxide. The applications of cold storage practice in bulb farming and market gardening are briefly described and the advantages of some form of refrigeration on a poultry farm both for keeping birds and eggs are indicated. Although the discussions of these latter subjects are somewhat short, sufficient is said to bring out the increasing importance of refrigeration on the farm. The book is primarily written from the point of view of the engineer, but the references and the biological applications are sufficiently numerous and lengthy to justify its purchase by farmers seeking advice from this angle. To the veterinarian, who should endeavour to keep abreast of modern developments on the farm, this book can be strongly recommended. It is well written, cheap and supplies a definite want. For the price its publishers have produced a clear, well-illustrated and presentable volume.

TUBERCLE-FREE HERDS IN AYRSHIRE

It was reported at the annual meeting of the Ayrshire Herd Book Society that the number of tubercle-free herds in Ayrshire is now 212, which is approximately 13 per cent. of registered dairy herds in the county. There are 135 attested herds, of which number all but eight are licensed for the production of certified or tuberculin-tested milk. In addition there are 73 herds licensed for the production of certified or T.T. milk which have not yet become attested.

* * * * *

When fining a man 10s. at Llanerchymedd for carelessly driving a car into a drove of cattle near Rhosybol, the Chairman, Sir William Hughes-Hunter, remarked that "Drovers should take up a position, one in front and one some distance behind their charges when rounding a bend, so that ample warning can be given to motorists approaching either way."

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Jan. 14th.—Veterinary College of Ireland: Students' Annual Dance, Metropole Ballroom, Dublin, 9 p.m.

Jan. 15th.—Annual General Meeting of the Mid-West Division, N.V.M.A., at the Royal Hotel, College Green, Bristol, 3 p.m.

Jan. 16th.—Scottish Branch, N.V.M.A., General Meeting at Perth, 2 p.m.

Jan. 18th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, 4 p.m.

Jan. 22nd.—Annual Meeting and Dinner, Royal Counties Division, N.V.M.A., Caversham Bridge Hotel, Reading, 6 p.m.

Jan. 29th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds, 3 p.m.

Feb. 26th.—Annual Dinner and Dance of the Yorkshire Division, N.V.M.A., at Leeds.

* * * * *

HIS MAJESTY'S PATRONAGE

The National Veterinary Medical Association of Great Britain and Ireland is in the happy position of being included in the organisations concerned in the following announcement:—

"The Keeper of the Privy Purse is commanded by the King to state that His Majesty is pleased to intimate to those Societies and Institutions which were recently granted Patronage by King Edward VIII, that they may continue to show the Sovereign as their Patron during the present reign, unless otherwise notified."

* * * * * *

YOUR BOURNEMOUTH WEEK

The provisional programme of the Congress of the Association to be held at Bournemouth from July 26th to 30th is published in this issue and furnishes strong support for the appeal, made by the President in his New Year message, that members should exert a special effort to attend, with a view to making our Coronation Year Conference an outstanding success.

Within the limitations imposed upon the Local Committee by such inescapable considerations as time (five days) and place (a seaside resort offering a host of attractions), it would be impossible to provide a series of papers more representative of the varying professional in-

terests of the modern veterinarian, while we are confident that the choice of essayists and openers of discussions will meet with universal approval. The social programme wisely retains the features which experience has proved to be those most calculated to enhance the enjoyment of Congress Week.

* * * * *

PERSONAL

Miss Barbara Hutton's Appointment

Since the commencement of Miss Aileen Cust's activities in general practice, which marked the entry of women into the British veterinary profession, there have been numerous other examples by way of refutation of the view that their field of professional endeavour would be confined to work amongst small animals. None is of greater interest, however, than the recently-announced appointment of Miss Barbara Hutton, M.R.C.V.S., to the Veterinary Staff of the Devonshire County Council, for Miss Hutton thereby becomes the first lady veterinarian to secure a post as Assistant Veterinary Officer to a local authority. We congratulate Miss Hutton, who graduated at London a year ago, on an appointment which enables her to make an important and significant contribution to the history of veterinary public health work.

. . . . . .

Major J. J. Plunkett's Injury.—In our issue of December 26th, 1936, we reported, with much regret, the serious injury sustained in the hunting field by Major James J. Plunkett, O.B.E., of the Royal Army Veterinary Corps. Major Plunkett writes from Melton Mowbray War Memorial Hospital to inform us that he is suffering from a fractured pelvis and that, as we are very glad to learn, there are no complications and he is making very satisfactory progress.

. . . . . .

Presentation to Mr. Matthew White.—A public presentation from people in Orkney was made at Kirkwall on December 28th, 1936, to Mr. Matthew White, M.R.C.V.S., County Sanitary Inspector for Orkney, on the occasion of his retirement. He also received gifts from the Orkney East Mainland Horse Breeding Society, Mr. White, who is to reside in Edinburgh, is a native of Glasgow. He was appointed Veterinary Inspector and Sanitary Inspector for Shetland in 1912, holding the latter post till 1915 and the former till 1928, when he was appointed Sanitary Inspector for Orkney. Before going north he was a leading figure in Scottish homing pigeon circles, and has remained prominent in dog breeding, showing, and judging activities.

* * * * *

R.C.V.S. OBITUARY

Norman, G. D., Ivy House, Nailsea, Somerset. Major, late R.A.V.C. Graduated London, May 18th, 1892; died December 23rd, 1936, aged 66 years.

Major G. D. Norman, M.R.C.V.S.

Major Norman, whose death we announce above with much regret, joined the Royal Army Veterinary Corps in 1914. He served in France and was the last veterinary officer to leave France after superintending the sale of all horses and mules.

Major Norman was for many years a veterinary surgeon at Nailsea, with a large practice at Clevedon and in the surrounding districts. He was also a member of the Coleridge Lodge of Freemasons, at Clevedon.

* * * * *

LEGAL NOTE

Farmers' Indifference to Record Keeping.—When a Stirlingshire farmer was charged with two offences under the Movement of Animals Order, the Procurator-Fiscal stated that 17 cows, 1 calf and 36 sheep were involved. The police had found that accused had nothing entered in his records book later than July. It seemed to him that there was a degree of carelessness on the part of farmers which was to be deplored. Farmers seemed to think it was a matter of indifference whether they kept records or not. The books were actually supplied to them free, with headings all printed in, and farmers had merely to note entries. Accused was liable to a penalty of £5 per animal. A fine of 40s. was imposed.

* * * * *

ROYAL SANITARY INSTITUTE CONGRESS

The Minister of Health, Sir Kingsley Wood, will address a general session (to be held on the afternoon of Tuesday, July 13th) of the Health Congress of the Royal Sanitary Institute which is to take place at Birmingham from July 12th to 17th, 1937. The President of Section D (Veterinary Hygiene) will be Major W. Brennan DeVine, *M.C.*, F.R.C.V.S., Chief Veterinary Officer, Birmingham, while the Recording Secretaryship will again be in the capable hands of Lieut.-Colonel J. A. Dixon, *T.D.*, M.R.C.V.S., Chief Veterinary Officer, Leeds.

* * * * *

LUNG SICKNESS CONTROL IN SOUTH-WEST AFRICA

According to the *Star*, Johannesburg, the alleged introduction of lung sickness from the Okavango district of South-West Africa into the Bechuanaland Protectorate was the primary reason for the visit of Mr. John Hobday, B.Sc., M.R.C.V.S., Chief Veterinary Officer to the Bechuanaland Administration, to Windhoek early in October, the visit being made by aeroplane. It was believed that lung sickness had been introduced from the northern part of South-West Africa, and the two administrations are now to co-ordinate their efforts to prevent this spreading. By mutual agreement no movement of stock is allowed outside the police zone in South-West Africa. Another matter which Mr. Hobday discovered was the possibility of the South-West African Administration disposing of pedigree karakul stock to the Bechuanaland Administration; also a scheme for the export of livestock from Bechuanaland on the hoof as beef from Walvis Bay.

The route which Mr. Hobday took in his aeroplane across the Kalahari between Ganzi and Windhoek had never been flown before (and had proved on this occasion to be a very rough passage), the total distance being 300 miles. It was so hot that he literally "stripped to the skin," his socks and shoes being his only emblems of civilisation! (Those who knew him at the London College will fully realise that this departure from conventional propriety did not really trouble him very much!)

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ANIMAL HUSBANDRY IN CHINA: IMPROVEMENT PROBLEMS

In the course of an important contribution on "Animal Husbandry in China," occupying the major portion of the October, 1936, issue of the *Inspection and Commerce Journal*, issued by the Chinese Government Testing Bureau of Shanghai, Dr. V. Tsai, Commissioner to the Bureau, states:—

"The methods of animal husbandry vary according to the customs and environmental conditions of different regions. In the vast area of Mongolia people are mainly pastoral. Horses are numerous and they are divided into herds. One herd is usually composed of 500 animals, of which 300 are mares, 180 geldings, 15 to 18 foals. In order to prevent different herds from mixing up, the herdmen riding on fast horses control them with long bamboo canes in their hands. A herd stays two weeks at a place, and then goes elsewhere. The lapse of two to four weeks is necessary before the herd is driven back to the original site in order to allow the grass to grow. Late in the fall, when grass becomes thin, men and horses return home. In winter, a complementary ration of oat and bran is given to them beside whatever withered grass they can find under the snow.

"With regard to cattle, a herd is composed of only 20 to 30 head. They also roam on the prairie as the horses do. Cows are milked twice daily in summer and once during other seasons. Their average milk production is around 4 to 5 lb. There are also great herds of sheep in Mongolia. A shepherd easily takes care of three to five herds composed of 200 to 300 head, with the help of two dogs. Sheep are kept out nearly all the year round except during the snow season. In winter they are fed with prairie hay just as a maintenance ration.

"In China Proper, because the system of farming is based upon crop production and the grazing land is consequently scarce, the method of animal husbandry is entirely different from that of Mongolia. Stable-feeding is the only method to enable farmers to raise a few animals. Horse raising is little undertaken because the supply of riding horses has to come mainly from Mongolia, Kokonor and Tibet, where better horses can be raised. However, at different localities mares are kept not solely for their reproduction of foals but mainly for their milk, which is in demand. Cattle are kept on the farms as labour animals. Sheep, goats and swine are raised for their manure for fertilising lands and for consuming the waste and by-products as bran, distilleries' wastes, etc. Cattle breeding is done in some localities; for instance, in the northern part of Anhwei and southern part of Chekiang, where a large number of people devote their time to raising small herds of 10 to 20 head. When cattle reach their working age of two to three years old, they are sent to the market and sold to dealers, who in turn sell them to the farmers. Hogs are universal farm animals in the interior part of China. There is division of work in raising hogs. Some specialise in keeping sows for giving litters, some devote their time to raising young pigs, and others are interested in fattening them. Thousands of pigs thus are transported from the northern part of Kiangsu to the southern part of the province and to some localities in Chekiang.

"The economical utilisation of the small streams, canals and ponds for raising ducks has been practised everywhere, especially in Kiangsu and Chekiang, where the network of canals is quite wide-spread. Beginning from the later part of spring, thousands of ducklings are seen paddling along the banks of the canals. As they grow, they find more of their feed from the water than from the pail. The management is very simple if disease does not spell damage. The feeding and sheltering of a thousand ducks requires only the labour of a man and a boy; and so the raising of ducks is more economical. A small flock of six to ten chickens is found on every farm. However, very few chicks are hatched by the farmers themselves, and large numbers are supplied by the hatcheries. The hatching of chicks as well as ducklings is an art as well as a science practised long by the Chinese. The capacity of each hatchery is enormous, for thousands of chicks or ducklings can be brooded at one time. Its efficiency is quite high, for about 60 per cent. of the eggs incubated can be hatched. But it is more astonishing to know that every hatchery is so simple in construction and entirely lacking in scientific equipment. Though temperature control is important in hatching, yet thermostat is not used, but the heat is judged as the eyelids depend. There are no mammoth incubators but large straw baskets which can hold two to five hundred eggs. A basket is constructed in such a way that it looks like a steam boiler with a straw lid. At the bottom a gentle fire can be started if necessary, and the eggs are piled regularly above the heating place. A dozen or more of the straw baskets are arranged along the side of the wall. Near to the ceiling of the room a straw bed is spread on a platform. This arrangement is to use the warmer part of the room for further hatching of eggs. Generally eggs are kept in the straw baskets at varying temperatures from time to time for about two weeks or more, and then they are transferred to the straw bed just one or two days before the chicks break out of the egg shells. Baby chicks are distributed as far as 100 miles from the hatchery. In this way millions of baby chicks are hatched each year. A trade so enormous can easily earn an outstanding position in the world industry of hatchery.

"The long civilisation and vast territory of China have caused the creation of many breeds of farm animals and birds. China possesses breeds of hogs the blood of which has contributed to the development of the world famous breeds, Berkshire and Yorkshire, known for their easy fattening. Chinese chickens, Langshan and Cochins, which have been used in creating Orpington, Wyandotte and Feverolle, three well-known breeds, are remarkable for their ample form, delicious meat, and ability to lay in winter. Every one knows Peiping duck, famous for its beautiful conformation and early maturity. The donkey of North China is a splendid animal of high endurance for hardship to which even that from Paotow is in no way superior. The Mongolian horse, though lacking in elegance, is a rustic and resistant animal, perfectly adapted to the severe environment of the arid country. The Chinese farm animals and birds, therefore, possess many good qualities, because they are able to live in complete adaptation to the agricultural and economic conditions of the environment in which they are raised, even though they may be of inferior quality in comparison with the improved breeds of foreign countries. The work of improving Chinese breeds is necessary, but a systematic study of the native breeds in regard to their merits and defects as above mentioned and a complete survey of local conditions are more essential and urgent.

"Improvement of native breeds is (1) by means of methodical selection and (2) by the importation of improved foreign breeds as a means to replace local ones. As to the latter, not only is a big investment required, but different problems of acclimatisation, feeding, hygiene, infectious and parasitic disease have to be overcome before any success can be expected. With a view to introducing the strong characteristics of improved breed into native animals cross-breeding is always preferable to a wholesale importation of foreign stock. In fact, by using the method of crossing, it will be easy to get, within a short time, by importing a small number of sires, an appreciable quantity of hybrids which usually are improved individuals adapted to their native conditions.

"The introduction of the Arabian breed to be crossed with Mongolian horses with the object of securing greater height and impressiveness in the latter could be advocated. For a heavier type, the use of the small Percheron as sire should presumably give good results. The assertion is based upon the fact that the Mongolian horse has the same profile and probably the same origin as the Arabian while the Percheron horse may be considered as merely a bigger Arabian. For the same reason, the use of British hogs for crossing with Chinese breeds is worth trying, and should give better results than with other breeds. As for dairy type, the breeds which give the best results for crossing purposes are Holstein and Ayrshire.

"Animal husbandry in China has, in fact, not attracted the attention of the Government. Up to the present, all energies spent on agricultural reconstruction are rather concentrated on crop production. However, with a view to developing the north-western provinces, the National Economic Council is planning to establish a breeding station at Lanchow, in Kansu. In addition, there are some experimental stations and agricultural schools devoted partly to animal husbandry; the National Horse Breeding Station, at Chuyong, and the Central Breeding Station, at Nanking, recently founded, are worthy of mention. The Shansi Provincial Government has endeavoured for 18 years to improve the sheep of that province, but there is a lack of co-ordinated projects of breeding experiments between the different stations. The Chinese Government should not only encourage co-ordination of private projects, but also purchase selected animals for them and guard their interests by means of the provision of financial facilities.

"The problem of the prevention of animal diseases may be classified into four lines; namely, veterinary education, epizootic prevention service, veterinary research, and production of sera and vaccines.

Veterinary Education

As in human medicine, veterinary education in China can be divided into traditional and modern. The former embraces branches of veterinary medicine in the old Chinese fashion. The practitioners have no schools. Most of them gain their veterinary knowledge through apprenticeship either with their fathers, brothers, or relatives. Some have their specialities, hence, few are styled as horse or cattle doctors. Horses and cattle, by virtue of their economic importance in the rural districts and great use in the army, receive most medical attention; sheep, goats or swine less, while dogs or cats are given no consideration. The class of veterinary traditionalists is numerous; a conservative estimate of them would be more than 5,000. Their distribution is countrywide, but their service is limited by their meagre and unscientific veterinary knowledge. In spite of this, the enormous responsibility of the welfare of the Chinese national livestock industry mainly rests upon their shoulders at present.

"The modern class of veterinarians are graduates from the Chinese veterinary schools or foreign veterinary colleges. Their total number is small, and that of the foreign graduates as a group is still smaller. Eight of them graduated from the American institutions, *i.e.*, six from Iowa State College (one already deceased), two from Michigan State College, and one from Kansas State College. Four graduated from the French veterinary schools; more than a dozen received their training in Japan. The small nucleus of veterinarians forms the very foundation of modern veterinary education in China. Practically all of them are occupying the leading positions in the field of veterinary medicine, as prominent practitioners, professors, chief inspectors, bureau heads, etc.

"There are three centres of veterinary education; namely, the Military Veterinary School, the Department of Animal Husbandry and Veterinary Medicine of the Central Agriculture College of the National Central University, and the Veterinary School at Shanghai. Of the three, the Military Veterinary School is the oldest, started as a veterinary educational organisation about 31 years ago under the name of the School of Horse Medicine. Former President Yuan Shihkai was the promoter. About 16 years ago the school was removed from Paoting to Peiping, and its name was then changed to the present one. Seventeen classes have been graduated, and about 500 graduates have contributed to the entire body of army veterinarians and a portion of the meat inspectors in public health institutions.

"The Department of Animal Husbandry and Veterinary Medicine was organised only six years ago (1929), but a few veterinary courses had been offered even two years before. At present, it gives a four-year course of veterinary medicine and animal husbandry. Due to political reasons, the Department has graduated only 20 students who are engaged more in teaching than in research.

"The Veterinary School at Shanghai was organised about three years ago (1932). Its purpose has been to train a group of young men who after their graduation can undertake the work of meat inspection and epizootic prevention, as these types of veterinarians are in demand. Graduates from higher middle schools, having passed the entrance examination successfully, are given two years of concentrated veterinary education of collegiate standard and half a year of field practice before graduation. Forty members of the first class have, immediately after their graduation, filled positions as veterinary inspectors.

"These three institutions stand as the solitary monuments of higher education of veterinary medicine in China. Their handful of graduates annually would take long years to achieve the required number of 10,000 Chinese veterinarians. The farmers need graduate veterinarians to save their livestock industry which suffers annually a loss of hundred millions of dollars from epizootics of different forms.

"Only the advancement of veterinary education can advance the epizootic prevention service. In former days it was the army horses, not the farm animals, that had to be cared for, and hence there was the establishment of the School of Horse Medicine. During recent

years, the leading agriculturists of the country have conceived an epizootic prevention service. At present both the central and the provincial governments are designing a system for the prevention of animal diseases.

"The Epizootic Prevention Service under the Ministry of Industry was organised in 1932. It is now located at 400, Ziangying Road, Shanghai. Its activities, with a budget of about 40,000 dollars annually, consist of the following: (1) epizootic prevention, (2) investigation of disease distribution, (3) diagnosis of diseases, (4) research and (5) production of sera and vaccines for animal use. Its purposes are to supply useful information in regard to disease prevention obtained from experimentation and investigation, and to stimulate interest in and encourage activities for epizootic prevention. It now controls two experimental districts, one at Shanghai and the other at Taihing district in Kiangsu province, but the Service has planned another epizootic prevention experimental district in Chekiang in conjunction with the provincial government. The North-west Epidemic Prevention Bureau under the Health Administration was established in 1934. A department of Epizootic Prevention has been organised in the Bureau to deal with the problem of disease prevention in the north-west.

A preliminary survey of the most common diseases of the region has revealed that rinderpest, anthrax and glanders are most prevalent. Measures have been taken to produce anthrax serum and vaccine.

The provincial governments which have maintained veterinary services are Chekiang, Kwangtung, Kwangsi and Kiangsi. By far the largest in organisation is the one in Kwangsi where about $400,000 has been spent for the serum laboratory. For the current year Kiangsi has a budget of $13,000 for veterinary work. There the method of quarantine and disinfection has been emphasised more for combating outbreaks of animal diseases than prophylactic injections. The Chekiang veterinary force has been granted $6,000.

"The production of sera and vaccines has been progressing by leaps and bounds. During the last five years, five biological laboratories mainly devoted to the production of sera and vaccines for animal use have been established, two under the control of the Ministry of Industry, one under the Health Administration, one under the Kwangtung Provincial Government and one under the Kwangsi Government. At present the number of biologic institutions is quite enough. Each one of them has met the same difficulty of being limited by little demand. From now on the policy should be to strengthen the laboratories already existing rather than to set up new ones.

"Veterinary research in China is in its rudimentary stage because in veterinary education itself there is still a barren field. The Epizootic Prevention Service is perhaps the only place at present carrying on veterinary research. Its project of research centres around two points; namely, methods of diagnosis and methods of sera and vaccine production. In searching for new methods of diagnosis, bacteriological, pathological, and serological studies of diseases have been emphasised. Out of the numerous contagious diseases, four most important virus diseases, hog cholera, rinderpest, chicken pest, and fowl influenza, and two bacteria diseases, swine plague and chicken cholera, have been selected for study. Bovine contagious pleuropneumonia, a problem of the Shanghai dairies, is also under investigation."

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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VETERINARY RESEARCH AND THE REQUIREMENTS OF AGRICULTURE

To the Editor of the Veterinary Record

Sir,—Mr. Pollock's letter under the above heading is particularly interesting at the present time, as expressing what a modern veterinary graduate can do in country practice both financially and socially—if only he is fond of and knows his job—"starting from scratch in rural England"; and he himself says it is not intended as a boast, but as an encouragement to "illustrate that what one does others can."

Although his letter deals largely with the financial prospects of private practice and State Service in Australia, its lesson can be taken to heart to equal advantage in this country, and it must have been interesting to Mr. Pollock himself when he returned to England to compare the conditions not only of the two countries, but also the altered prospects which the establishment of a State Service has given to the young graduate of to-day as compared with the day on which he graduated in 1924 from the London College. There must be no underrating by the young graduate of the importance of the financial prospect of whichever branch of the profession he intends to follow, for when once he becomes a family man, the butcher and the baker, the landlord and the tax-collector, have all to be provided for to an equal extent; and it is when there is difficulty in providing for these necessities of life that the pure scientist (who by that time has probably a family to think of) begins to wonder whether all the energy and time which he has devoted to his job (in which he has probably excelled and in which his financial limitations are bounded by a fixed salary), ought not to have been much more lucratively employed in some other sphere where his individual effort would have been appreciated—to the personal advantage, both socially and financially, of himself and his family.

Although in England the prospects of the young veterinarian in Government or Municipal Service compare favourably with other professions at the commencement—and the higher posts are well worth striving for—there is still too little encouragement in the rate of financial advancement in between. In other words, it takes too long to attain an income which will enable the father of a family to be able to give even one of his sons a Public School education, without severely handicapping the family purse. When one considers how very much agriculture, as indicated by the prosperity or otherwise of the livestock industry, is dependent on the researches and the application of veterinary science, and that this country holds a place second to none in the whole world for pedigree stock, it leaves one "wondering" at the parsimonious way in which veterinary research is treated. Nothing can be obtained without money and surely the "labourer is worthy of his hire."

It has been a source of great regret to me on many occasions to see young graduates—whom I knew from close observation to be men not only possessing the concentration and scientific

temperament which are so necessary to the research worker, but also fitted in other ways for the quiet scientific side of laboratory work—compelled to go into the rough and tumble of practice, because the financial outlook in research was not only comparatively poor but insecure. Other countries of the world have recognised this for many years, but it is only of late that we have commenced to move in this direction to any appreciable extent.

So few of our graduates are able to work for a pittance—even whilst gaining experience—that scholarships of £200 and £250 a year fail to attract them, especially when accompanied by restrictions which compel them to remain on this allowance for at least two years—even then with no definite promise of an assured position.

Yours faithfully,
FREDERICK HOBDAY.
Principal and Dean.

The Royal Veterinary College & Hospital,
Camden Town,
London, N.W.1.

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VETERINARY RESEARCH

To the Editor of the Veterinary Record

Sir,—There is one sentence in Mr. J. Smith's letter that seems to me lacking both in argument and conclusion and that is: "I suggest, Sir, that the man who can only be obtained by a financial bait is not the one who will carry on the work in an adequate manner." Why should not the man who is adequately paid do his work as well as, or even better than, the man who is parsimoniously paid? The days of low living and high thinking are not happy and contented ones either in reality or in retrospect. The above argument is on a par with that of the people who pride themselves that clean milk can be as readily produced in old, tumble-down and badly constructed cowsheds as in more modern examples.

Yours truly,
Bolton. G. MAYALL, M.R.C.V.S.

To the Editor of the Veterinary Record

Sir,—The columns of the *Veterinary Record* have recently dealt with the difficulty of obtaining veterinary surgeons capable of undertaking research, and a number of prominent people have expressed their view on the subject.

The Agricultural Research Council has many committees and if an additional committee was set up to enquire into the question, it might be able to advise the Ministry of Agriculture how veterinary research could obtain the right men.

I believe there are veterinary surgeons whose work in the field of research showed at least promise of a future, but who are now employed in other branches of the profession. Evidence from these men should assist the Agricultural Research Council in finding the reasons why veterinary research is not attractive.

Yours faithfully,
County Offices, A. J. WILSDON.
Hereford.
January 4th, 1937.

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NUTRITION IN THE COLONIES

To the Editor of the Veterinary Record

Sir,—I note in your issue of November 7th, 1936, under the above heading, the appointment of a committee.

(1) To survey the present state of knowledge in regard to nutrition in the Colonial Empire.

(2) To advise from time to time as to the measures calculated to promote the discovery and application of knowledge in the field.

In a circular despatch (Col. No. 121) Mr. Thomas has drawn the attention of Colonial Governments to the importance of nutrition in relation "not only to public health, but also to agricultural, veterinary, educational and general policy throughout the Empire." Why then, is it that there is not a single member of the veterinary profession on the committee?

In view of the fact that the health of the human population is largely dependent on the quantity and quality of the animal products it consumes, and that our present knowledge of nutritional diseases has largely come from veterinarians, it is surprising and humiliating to find that our profession has again been excluded.

No doubt the veterinary workers in the field will be invited to supply information to the committee, but that is not quite the same thing. It is not the veterinary profession which will derive the *kudos*.

In the light of Mr. Walter Elliot's generous recognition of the value of veterinary science to the State it is disappointing to find that we have again been overlooked.

I am, Sir,
Yours faithfully,
LL. E. W. BEVAN.

The Trypanosomiasis Bureau,
Salisbury,
Southern Rhodesia.
December 9th, 1936.

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TUBERCULOSIS OF THE PERITONEUM

To the Editor of the Veterinary Record

Sir,—I have the honour to refer to the *Veterinary Record*. 48. 51. p. 1506, where, in an article on "Bovine Sterility" by Professor Craig, there is printed:—

"(c) *Tuberculosis of the ovary* is occasionally seen and is associated with tuberculosis of the peritoneum, which can be readily determined."

I must confess that I am not in the fortunate position in which Professor Craig appears to be, for it is my experience that tuberculosis of the peritoneum in the cow is *not* readily determined at a clinical examination.

Perhaps Professor Craig would be good enough to state the signs which he considers to be pathognomonic of the condition.

Yours, etc.,
Sheffield. H. M. SALUSBURY.
January 2nd, 1937.

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A PUZZLING CASE IN A TERRIER

To the Editor of the Veterinary Record

Sir,—I should be glad if any member of the profession could help me with the following case.

The subject is a dandie dinmont terrier, two years old. At any pace other than a slow walk he carries one hind leg, first one and then the other, but never runs on all four. The condition is so bad that after ten or fifteen minutes, especially on rough ground, he is quite exhausted and lies down.

I gave the opinion that this was due to conformation, but the owner is very anxious to know of anything that might be of assistance.

Yours faithfully,
MARION STEWART.

North End Road,
West Kensington, W.14.
January 4th, 1937.